

Remarks:

The above amendment and these remarks are responsive to the Office action dated April 18, 2006.

Prior to entry of this amendment, claims 1-41 were pending in the application. Claims 1, 2, 4, 6-9, 20-22 and 38-41 have been rejected under 35 U.S.C. § 102(e) based on Wada (US 6,765,585). Claims 3, 5, 10-19 and 23-37 have been rejected under 35 U.S.C. § 103(a) based on Wada in view of Smith (US 6,285,349). Applicant respectfully disagrees.

Nevertheless, in the interest of furthering prosecution of the present application to issuance of a patent, applicant has amended claims 1, 5, 20, 38 and 39 to make the claimed subject matter more clear. Applicant also has cancelled claim 3 without prejudice. No new claims have been added. Accordingly, with entry of the present Amendment, claims 1, 2 and 4-41 remain pending in the application.

In view of the foregoing amendments, and the following remarks, applicant respectfully requests reconsideration of the rejected claims, and prompt issuance of a Notice of Allowability covering all of the pending claims.

Priority Claim

Applicant notes that the Examiner has again raised the issue of applicant's claim for the benefit of a prior-filed application where the later-filed application was not filed by an inventor named in the previously filed application. Applicant notes that the priority claim was removed pursuant to the Amendment dated January 6, 2006.

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Rejections under 35 U.S.C. §§ 102(e)

As noted above, claims 1, 2, 4, 6-9, 20-22 and 38-41 stand rejected under 35 U.S.C. § 102(e) based on Wada (US 6,765,585). Applicant traverses the rejection.

Wada relates to an image display system, processing method, and program. The display system has a colored-light sensor that "measures environmental information (more specifically, RGB or XYZ tristimulus values) within the image display region" of a display screen (col. 6, lines 25-28). Using this environmental information, the system "calculates the displayable color gamut that can be displayed by the projector" and obtains a "target color gamut" based on a profile selected by the user (col. 6, lines 40-48). The displayable color gamut and target color gamut are compared, and a conversion matrix that allows reproduction of the target color gamut is generated.

Contrary to the Examiner's assertion, Wada does not disclose receiving any reflection of the calibration image. Wada indicates only detection of the visual environment. In other words, Wada considers only ambient light when converting image information in accordance with a user-selected color gamut profile.

Wada also fails to disclose comparison of any received calibration image to an intended calibration image. Rather, Wada compares the displayable color gamut of the projector to a target color gamut selected from predefined color gamut profiles. The color gamut of a projector represents the range of colors that can be produced by the projector. The Wada comparison thus is completely independent of the calibration image (or any subunits thereof).

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Moreover, Wada does not disclose modification of an image based on an observable color characteristic. Wada concerns only the color gamut that may be produced by the projector. As will be appreciated by those skilled in the art, color gamut may not be observed.

Applicant also notes that Wada fails to consider any substitution of a subunit of a principal image with a calibration image on a display surface for purposes of determining appropriate modification of the principal image. As noted above, Wada considers nothing more than ambient light. Accordingly, there is no calibration area on the display surface forming a subunit of the greater principal area of the display surface, and there is no need for such a calibration area.

As amended, claim 1 recites:

A method of projecting an image with display-condition compensation, the method, comprising:

projecting a principal image onto a principal area of a display surface, the display surface disposed for viewing by one or more people;

projecting an intended calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area, the calibration area forming a subunit of the principal area;

receiving a reflection from the display surface of the projected calibration image;

comparing the received calibration image to the intended calibration image to determine an observed difference; and

modifying projection of the principal image based on the observed difference;

where projecting a principal image includes projecting a principal image without a portion of the principal image corresponding to the calibration area, and projecting a calibration image includes projecting the calibration image onto the calibration area while projecting the principal image without the portion.

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Wada does not disclose, teach or suggest every element of claim 1. For example, Wada does not disclose projecting a calibration image onto a calibration area that forms a subunit of the principal area onto which a principal image is projected, as recited in amended claim 1. Wada also fails to disclose receiving a reflection of a projected calibration image and comparing the received calibration image to an intended calibration image, as recited in amended claim 1. Wada fails to disclose modifying projection of a principal image based on an observed difference between an intended and reflected calibration image, as recited in amended claim 1. Furthermore, Wada fails to disclose, projecting a calibration image onto a calibration area while projecting a principal image without the portion corresponding to the calibration area, as recited in claim 1.

Claim 1 is distinguished from Wada for at least the reasons set forth above. Accordingly, claim 1 is allowable over Wada, and the rejection of claim 1 based on Wada should be withdrawn. Claims 2, 4 and 6-9 depend from claim 1, and thus are allowable over Wada for at least the same reasons as set forth with respect to claim 1. Accordingly, the rejection of claims 2, 4 and 6-9 also should be withdrawn.

Amended claim 20 recites:

A display device comprising:
a light engine apparatus configured to project a principal image and an intended calibration image onto a display surface, the display surface disposed for viewing by one or more people, where at least a portion of the intended calibration image has an intended first color characteristic;
an optical unit configured to receive a reflection from the display surface of the projected calibration image; and
a processor configured to

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direct projection of the intended calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area;
compare the received calibration image to the intended calibration image to determine an observed difference between the intended calibration image and the received calibration image; and
modify projection of the principal image based on the observed difference.

Wada does not disclose, teach or suggest every element of claim 20. In particular, Wada does not disclose a processor configured to direct projection of the intended calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area, and does not disclose a processor configured to compare the received calibration image to the intended calibration image to determine an observed difference between the intended calibration image and the received calibration image. Accordingly, Wada does not disclose a processor configured to modify projection of a principal image based on an observed difference.

Claim 20 thus is allowable over Wada for at least the foregoing reasons, and the rejection of claim 20 based on Wada should be withdrawn. Claims 21 and 22 depend from claim 20, and thus are allowable over Wada for at least the same reasons as set forth with respect to claim 20. Accordingly, the rejection of claims 21 and 22 also should be withdrawn.

Amended claim 38 recites:

A calibration unit for use with a projector having selectable color compensation and configured to project a principal image onto a display surface, the display surface disposed for viewing by one or more people, the calibration unit comprising:

a calibration light unit configured to project an intended calibration image onto the display surface, the intended calibration image forming a multi-pixel subunit of the principal image;

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an optical unit configured to receive the reflection from the display surface of the projected calibration image; and
an output device coupled to the optical unit for outputting a signal corresponding to the received calibration image.

Wada does not disclose, disclose, teach or suggest every element of claim 38. In particular, Wada fails to disclose a calibration light unit configured to project an intended calibration image onto the display surface wherein the intended calibration image forming a multi-pixel subunit of the principal image, and does not disclose an optical unit configured to receive the reflection from the display surface of the projected calibration image. Wada considers only ambient light. Claim 38 thus is allowable over Wada for at least the foregoing reasons, and the rejection of claim 38 based on Wada should be withdrawn.

Amended claim 39 recites:

A display device comprising:
means for projecting a principal image onto a display surface, the display surface disposed for viewing by one or more people;
means for projecting a calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area;
means for receiving a reflection from the display surface of the projected calibration image;
means for comparing the received calibration image to the calibration image projected to determine an observed difference between the received calibration image and the calibration image projected; and
means for modifying projection of the principal image based on the observed difference.

Wada does not disclose, teach or suggest means for comparing the received calibration image to the calibration image projected to determine an observed difference between

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the received calibration image and the calibration image projected. Instead, Wada proposes comparison of color gamets. Claim 39 thus is allowable over Wada for at least the foregoing reasons, and the rejection of claim 39 based on Wada should be withdrawn.

Claim 40 recites:

A storage medium readable by a processor, having embodied therein a program of commands executable by the processor to:

- project a principal image onto a display surface, the display surface disposed for viewing by one or more people;
- project a calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area;
- receive a reflection from the display surface of the projected calibration image;
- compare the calibration image received to the calibration image projected to determine an observed difference; and
- modify projection of the principal image based on the observed difference.

Wada does not disclose, teach or suggest compare the calibration image received to the calibration image projected to determine an observed difference. Accordingly, Claim 40 is distinguished from Wada, and the rejection of claim 40 based on Wada should be withdrawn.

Claim 41 recites:

An electronic device comprising:

- a light engine apparatus configured to project a principal image and an intended calibration image onto a display surface, the display surface disposed for viewing by one or more people, where a portion of the intended calibration image has an intended first color characteristic; and
- an optical unit configured to receive a reflection from the display surface of the displayed image of the projected calibration image;

the light engine apparatus and the optical unit cooperating to:

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project the calibration image onto a calibration area of the display surface when the principal image is not projected onto the calibration area;

determine an actual color characteristic for a portion of a reflection from the display surface of the displayed calibration image corresponding to the portion of the calibration image;

calculate a difference between the intended and actual color characteristics; and
modify projection of the principal image based on the calculated difference.

Wada does not disclose a light engine and optical unit that cooperate to determine an actual color characteristic for a portion of a reflection from the display surface of the displayed calibration image corresponding to the portion of the calibration image. Wada reviews only color gamut, which is not properly characterized as a color characteristic of the calibration image. Accordingly, Claim 41 is distinguished from Wada, and the rejection of claim 41 based on Wada should be withdrawn.

Rejections under 35 U.S.C. §§ 103(a)

As noted above, claims 3, 5, 10-19 and 23-37 have been rejected under 35 U.S.C. § 103(a) based on Wada (US 6,765,585) in view of Smith (US 6,285,349). Wada (US 6,765,585). Applicant traverses the rejection.

In the Office action, the Examiner acknowledges that Wada does not disclose projecting the image without a portion of the image corresponding to the calibration area "since Wada uses the same image display area for displaying both regular and calibration images." Nevertheless, the Examiner thus cites Smith, indicating that Smith discloses projecting a principal image without a portion of the principal image corresponding to the calibration area.

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Applicant respectfully disagrees with the Examiner's characterization of Smith, noting that Smith does not even project a calibration image onto the display screen surface. Furthermore, even if the Examiner's characterization were accurate, modification of Wada as the Examiner proposes would be contrary to the teachings of Wada, which the Examiner acknowledges call for using the same image display area for regular and calibration images.

The Examiner also acknowledges that Wada fails to disclose segmenting the calibration image into a plurality of subunits, and again cites Smith as instructive in this regard. Applicant again disagrees with the Examiner's characterization of Smith, noting that although correction coefficients are applied pixel by pixel in Smith, the calibration image is not segmented into a plurality of subunits in Smith.

Furthermore, modification of Wada as the Examiner proposes would be contrary to the teachings of Wada, and thus is inappropriate. As noted throughout these remarks, Wada senses the visual environment, and thus would be unsuitable for modification to the pixel by pixel analysis that the Examiner proposes. Such a modification would represent a fundamental change to the function of Wada.

The Examiner also acknowledges that Wada fails to disclose using two light sources, one projecting a regular image and another projecting a calibration image. Again, the Examiner turns to Smith. Again, applicant respectfully disagrees with the Examiner's characterization of Smith. The language cited by the Examiner discloses nothing more than use of "multiple light outputs that may aligned to create a composite

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image on the display screen." There is absolutely no mention of different light sources to project a regular image and calibration image.

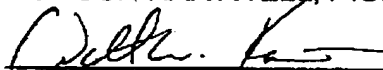
In view of the foregoing, the proposed combination of Wada and Smith is inappropriate, and the rejection under 35 U.S.C. § 103(a) should be withdrawn. Furthermore, claims 5, 10-19 and 23-37 (claim 3 has been cancelled without prejudice) depend from claims 1 and 20, and are allowable for at least the reasons set forth with respect to claims 1 and 20 above.

Conclusion

Applicant believes that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, applicant respectfully requests that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Respectfully submitted,

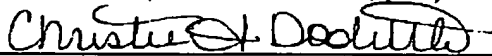
KOLISCH HARTWELL, P.C.



Walter W. Kamstein
Registration No. 35,565
520 S.W. Yamhill Street, Suite 200
Portland, Oregon 97204
Telephone: (503) 224-6655
Facsimile: (503) 295-6679
Attorney for Applicants

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to Examiner A. Caschera, Group Art Unit 2628, Assistant Commissioner for Patents, at facsimile number (571) 273-8300 on July 18, 2006.



Christie A. Doolittle

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